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# Accepted Manuscript

Do Tax Havens Create Firm Value?

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Do Tax Havens Create Firm Value?<sup>☆</sup>Siu Kai Choy<sup>a</sup>, Tat-kei Lai<sup>b</sup>, Travis Ng<sup>c</sup><sup>a</sup>King's College London<sup>b</sup>IESEG School of Management (LEM-CNRS 9221)<sup>c</sup>The Chinese University of Hong Kong

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**Abstract**

On October 11, 2011, a non-governmental organization called ActionAid published a report condemning the FTSE 100 firms for holding an unusually large number of subsidiaries in tax havens. Urging the government to implement appropriate actions, the report raised the firms' costs of holding tax haven subsidiaries. After this event, the stock prices of the nonfinancial firms experienced a 0.9% abnormal drop (corresponding to about £9 billion in market capitalization). Those better-governed firms and those with larger shares of subsidiaries in tax havens experienced larger drops. We find some evidence that government scrutiny, reputation, and investor sentiment were plausible channels of such a negative impact.

**Keywords:** Tax Havens, Firm Value, Corporate Governance, Corporate Tax, Event Study

**JEL Classifications:** G14, G30, H26

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# 1. Introduction

Holding subsidiaries in tax havens, a firm can create value by enlarging its set of trading opportunities and reducing tax; however, without additional checks and balances, the management can misuse these opportunities to undermine shareholders.<sup>1</sup> Do tax havens, on the net, provide value to shareholders? To answer this question, we conduct an event study on the largest publicly-listed firms in the United Kingdom. A rare event occurred on October 11, 2011. ActionAid, an international non-governmental organization (NGO), published a report entitled “Addicted to Tax Havens: The Secret Life of the FTSE 100” (ActionAid, 2011).<sup>2</sup> This highly-publicized report presents all the subsidiaries of the Financial Times Stock Exchange (FTSE) 100 firms and their locations in an online spreadsheet.<sup>3</sup> The title of the report suggests that the FTSE 100 firms had a noticeable presence in tax havens. As of July 26, 2011, they held over 30,000 subsidiaries, 8,492 of which were located in tax havens.<sup>4</sup>

We follow Fisman (2001), who estimated the value of political connections for Indonesian listed firms by using news on the unexpected health problems of President Suharto. In our context, amid the several high-profile austerity programs in the U.K., the ActionAid report aimed to arouse public anger and urge the British government to “get tough” and “crack down” their presence in tax havens. The event likely raised the future costs for firms to hold subsidiaries in tax havens because politicians during that time were highly motivated to agree with the report and further condemned the firms and their tax haven subsidiaries. They did so and thus directly elevated the expected probability that the British government would “get tough” on these firms. However, expecting the government to scrutinize all firms together at once was unrealistic. Such a change in expectation varied across firms. In particular, firms that held a large share

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<sup>1</sup>For example, refer to the analysis in a related study conducted by Desai et al. (2007).

<sup>2</sup>Further details of the event are in the Online Appendix.

<sup>3</sup>The event is *not* a corporate event, which is a problem of event studies examined by Hirshleifer (2001). “One explanation, event selection, is that a firm’s decision whether and when to engage in the event depends on whether there is market mis-valuation. A second possibility, manipulation, is that around the time of the action the firm reconfigures other information reported to investors in order to induce mis-valuation.” This political event, similar to President Suharto’s health in Fisman (2001), is exogenous to firms, thereby lending credibility to the event study.

<sup>4</sup>These tax havens are in the list compiled by the Government Accountability Office of the U.S. Congress; see their publication “International Taxation: Large U.S. Corporations and Federal Contractors with Subsidiaries in Jurisdictions Listed as Tax Havens or Financial Privacy Jurisdictions,” December 2008.

of their subsidiaries in tax havens relative to those that held a small share were likely to be scrutinized sooner. As such, ActionAid (2011) should affect these firms more. Examining the changes in firm value caused by this event provides an estimate of the value tax havens bring to shareholders.

In Section 2, we use a model to highlight the underlying theoretical mechanisms through which the event affects firm value. A value-maximizing firm deliberately chooses its presence in tax havens, taking into consideration the associated benefits and costs (Desai et al., 2006a).<sup>5</sup> The benefits associated with the presence in tax havens include increased trading opportunities and reduced taxes. The associated costs involve direct costs and difficulty dealing with the tax authority. Detecting management misconduct, if any, such as extracting private benefits from shareholders (i.e., agency cost), is also made difficult by tax havens. Stronger corporate governance makes any form of misconduct difficult to go unnoticed (Desai et al., 2007).<sup>6</sup> The model therefore relates firm value, managerial diversion, offshore tax havens, and locating assets in tax havens within a value-maximizing framework. It predicts that firm value decreases with the cost of locating assets in tax havens, particularly among those better-governed firms.

One may argue that shareholders do not welcome corporate inversion, a practice used by firms to relocate their legal domiciles to tax havens while maintaining their operations in high-tax jurisdictions. This issue is different from the one investigated in this study because the firm in our model selects the locations of its subsidiaries rather than its own legal domiciles. In reality, while relocating subsidiaries can be frequent, changing legal domiciles among the FTSE100 firms is a relatively rare corporate decision.

*Was the event relevant and significant?*

Considering that the success of a report depends on its effect on the society, ActionAid had the incentive to release the report at the “right” time. We argue that ActionAid (2011)

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<sup>5</sup>One may wonder whether investors have preferences over their companies’ investments in tax havens. In our model, firms choose an appropriate combination of subsidiaries located in tax havens and non-tax havens to maximize shareholder value. Therefore, ex ante shareholders may prefer more or fewer tax haven subsidiaries depending on how these subsidiaries create firm value.

<sup>6</sup>A firm may also incur other costs when using tax havens. For example, additional organizational costs may be involved, shareholders may be confused about which parts of the business are profitable, or shareholders become concerned about the legitimacy of the firm’s large accounts.

was a relevant and significant event to firms. First, in addition to widespread media coverage, a number of British politicians created a scene in response to ActionAid (2011). For two consecutive days, two groups of members of parliament (MPs) sponsored and signed two early day motions in response to the report. They urged the government, the U.K. tax authority, and the HM Revenue & Customs (HMRC) to take immediate actions and address such dubious organizational strategies. Second, the political environment prior to the event date suggested that the British government and the HMRC had incentives to take actions. These actions include addressing the skyrocketing budget deficit in the U.K., public anger toward tax-avoidance activities, especially among large firms, the scandals of the HMRC, the British government's plan to tackle avoidance activities, and consumer boycott activities.<sup>7</sup> Third, the ActionAid report aroused the attention of the media (and the public) about the tax-avoidance activities of U.K. firms. Our Factiva search shows that the media echoed the moves of the politicians and the government by more frequently reporting the tax-avoidance activities of these firms after ActionAid (2011). Specifically, a surge in U.K.-specific articles concerning the tax-avoidance activities of U.K. firms occurred after the event. Within a quarter before the event, three U.K.-specific articles related to tax-avoidance activities were noted; within two quarters after the event, 34 related articles were found. In the U.S. (as a control group), the numbers of similar articles a quarter before and two quarters after the event were 1 and 3, respectively.<sup>8</sup> Fourth, the literature suggests that firms and managers have reputation concerns on tax activities (e.g., Graham, Hanlon, Shevlin, and Shroff 2014, Ernst and Young 2014).<sup>9</sup>

*Did the event causally reduce the share prices of the FTSE 100 firms?*

Section 3 presents our empirical analysis. Our baseline estimation examines whether these firms registered negative cumulative abnormal returns (CARs) over the  $[0, 1]$  event window. We use a multi-factor market model to distinguish firm-specific stock price movements from market-wide price movements (Morck, Yeung, and Yu, 2000). We find that non-financial

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<sup>7</sup>The Online Appendix also provides the political background.

<sup>8</sup>See the Online Appendix for the detailed results.

<sup>9</sup>For instance, Graham et al. (2014) survey on 600 corporate tax executives in the U.S. showed that reputation concerns are important in explaining the firms' decisions to engage in tax-planning activities. Ernst and Young's (2014) survey on 830 tax and finance executives in 25 jurisdictions indicated that firms are concerned about the media's attention to their tax activities.

FTSE 100 firms registered CARs of  $-0.9\%$  from day 0 to day 1.<sup>10</sup> This reduction was not small; it was about £9 billion in market capitalization or  $1.5\%$  of the tax revenue of the U.K. government in 2011. Furthermore, better-governed firms registered a bigger loss. The CARs would be 0.76 percentage points more negative if a firm of corporate governance standard was at the third quartile rather than at the first quartile.

We perform several robustness checks. We check the extent to which our event was news to the market. The media and many NGOs (including ActionAid) had been agitating about tax havens being a vehicle for firms to avoid paying taxes. NGOs are not legally obliged to prevent their own news from leaking out before their official release. We also check the presence of any delayed market response. We use different pre-event and post-event windows and found no significant market reactions. This finding suggests that prior news leakage and delayed market responses are unlikely to be serious concerns. We also perform a placebo test on matched firms in France and Germany. Given that the event was unlikely to affect comparable French and German firms, these firms should not have had any abnormal returns. Indeed, they did not exhibit abnormal price movements.

*Did firms register negative CARs because of their tax haven subsidiaries?*

We address this issue in Section 3.5. If different interest groups and the British government in particular contemplated scrutinizing the firms in light of ActionAid (2011), they would likely begin with only several firms. Firms with an unusually large share of tax haven subsidiaries are more likely to be picked. These firms should thus register more negative CARs. Our results show such a pattern. This pattern is robust to the various definitions of “tax havens.” For instance, Delaware, a popular location for FTSE 100 firms’ subsidiaries, was regarded by ActionAid (2011) as a tax haven. Excluding Delaware from the list of tax havens does not affect our results. In addition, several tax havens are more of a “red flag” than others; they immediately elicit the attention of tax collectors and are more likely to be on their “hit” lists. We find that firms with a higher share of their subsidiaries in these “red flag” havens (expressed as a share of number of subsidiaries, number of foreign subsidiaries, or number of haven subsidiaries)

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<sup>10</sup>We focus on non-financial firms; including financial firms would provide similar results.

registered more negative CARs.

*What were the channels through which the report lowered firm value?*

We explore the following four plausible channels in Section 3.6. First, the firms' consumers might buy elsewhere if the report indeed aroused public anger.<sup>11</sup> Second, the report directly damaged the reputation of firms. Third, the report caused the investors to believe that firms would face increased political scrutiny for their presence in tax havens. Lastly, the news was disliked by certain groups of people who were holding or might hold these firms' shares, thus indirectly increasing the firms' future financing costs. We divide the sample among different types of firms according to the proxies of these plausible channels and compared the CARs of the different types of firms. In sum, we obtain evidence suggesting that the second, third, and fourth channels are the likely channels.

### *1.1. Related literature*

Our study relates to the literature that studies the effects of tax avoidance on firm value, including the investigations conducted by Desai and Dharmapala (2009) and Hanlon and Slemrod (2009).<sup>12</sup> Desai and Dharmapala (2009) examine the relation between corporate tax avoidance (measured by the "book-tax gap") and firm value (measured by Tobin's Q) and found that tax avoidance does not exert a direct effect on firm value; instead, it exerts a positive effect on firms with strong governance. Hanlon and Slemrod (2009) use an event-study methodology to examine the market reaction to news that a firm has engaged in aggressive tax behavior. They found a negative market reaction to these news; the effect is more negative in the retail sector but less so for firms with a high cash effective tax rate.

Notably, Desai and Dharmapala (2009) and Hanlon and Slemrod (2009) focus on tax avoidance activities rather than tax havens per se. By contrast, our study focuses on a different issue: whether tax havens generally bring value to a firm. Tax havens are not merely about

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<sup>11</sup>This channel is motivated by the British consumers' boycotting Starbucks in 2012 because of its tax avoidance scandals. See the report "UK Uncut protests over Starbucks 'tax avoidance'" on December 8, 2012 at <http://www.bbc.co.uk/news/uk-20650945>.

<sup>12</sup>Related to this literature are studies examining the relationship between tax avoidance and firm performance or policies. For example, see Graham and Tucker (2006), Desai and Dharmapala (2006), Dyreng et al. (2013), Hanlon et al. (2015), and Brooks, Godfrey, Hillenbrand, and Money (2016).



tax avoidance for the following reasons. First, firms can have legitimate reasons to set up a subsidiary in a tax haven other than avoiding tax. For instance, several Caribbean tax havens specialize in reinsurance business and have developed the necessary legal infrastructure; a Hong Kong subsidiary can be conducive to the firm's business in China. Second, a firm can avoid tax without an offshore tax haven (e.g., tax planning between two states within the U.S.).<sup>13</sup>

This study also contributes to the growing literature that examines how tax havens affect non-tax havens at the country level (see the surveys of Hines 2010, Hanlon and Heitzman 2010, etc.). A strand of this literature examines the effects of tax havens on non-tax havens. Desai et al. (2006a,b) show that tax havens can reduce the cost of trading with high-tax jurisdictions and thus promote investment and economic activities there. For instance, using debt financing from haven subsidiaries helps a firm lower its tax burden in trading with a high-tax jurisdiction. Rose and Spiegel (2007) show that countries with a tax haven nearby have a highly competitive banking sector with significant financial depth. Devereux (2012) show that tax havens reduced the average corporate tax rate among member countries of the Organization for Economic Co-operation and Development (OECD) from roughly 47% in 1983 to around 27% in 2012. Hong and Smart (2010) determine the theoretical conditions under which tax competition benefits competing countries.<sup>14</sup>

Our study also relates to Bannedsen and Zeume (2015) who hand-collect data on subsidiary information for over 17,000 firms in 52 countries to investigate the motives of these firms for establishing subsidiaries in tax havens. They find that tax haven subsidiaries are

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<sup>13</sup>To see the similarities and differences between the issue of “tax avoidance versus firm value” studied by Desai and Dharmapala (2009) and Hanlon and Slemrod (2009) and the issue “tax havens versus firm value” studied by the current authors, let  $A$  and  $B$  represent the sets of business activities associated with tax havens and with tax avoidance, respectively, in a Venn diagram. The two sets overlap, but they are not necessarily identical.  $A = B$  implies that a Californian firm that exploits the tax code differences between California and Oregon to lower its tax cannot be regarded as avoiding tax because neither California nor Oregon is a tax haven. Meanwhile, when a British firm finds Bermuda an appropriate base for its reinsurance business, every transaction involved has to do with tax avoidance. These counterexamples are in the non-overlapping areas of  $A$  and  $B$  and suggest that “how much do tax havens bring to the table?” and “how much does tax avoidance bring to the table?” are two related but different questions.

<sup>14</sup>With various base erosion and profit shifting (BEPS) policies across the world, in which the OECD has received the most attention, research has moved beyond simple descriptive statistics by carefully estimating the extent of BEPS. (Dharmapala, 2014) survey state-of-the-art estimation methods used in the literature by using both aggregated and firm-level data. He also estimated that increasing the tax rate difference between the parent firm's country and the subsidiary's country by 10% would increase the pretax income reported by the subsidiary by 8%. (Dharmapala, 2014) conclude that around 2% to 4% shift in the parents' income is a reasonable estimate.

utilized to serve tax and entrenchment motives. We incorporate these two elements in our theoretical model. Our results for the FTSE 100 firms complement Bennedsen and Zeume's (2015) results for international firms.

ActionAid (2011) has also been used by other studies as an exogenous event. Dyreng et al. (2016) examine whether the FTSE 100 firms changed their corporate tax behavior after the release of the ActionAid report. They found that those firms that did not fully disclose their subsidiaries to the Companies House began to disclose; the firms also reduced their usage of tax havens relative to other FTSE 100 firms which, before the release of the report, were in full compliance with the disclosure rule.<sup>15</sup> Moreover, the effective tax rates of these firms also increased. Dyreng et al. (2016) document these changes as responses to the public pressure generated by ActionAid (2011). Their results suggest that ActionAid (2011) successfully induced certain public pressure.

## 2. Theoretical Motivation

In our empirical analysis, we estimate the market reaction of the FTSE 100 firms to the release of ActionAid (2011) and investigate the different market reactions among firms with different corporate governance standards. We motivate our empirical analysis by modeling a sequential-move game between a firm and its manager; this game incorporates the models in Desai et al. (2006a) and Desai et al. (2007). We discuss the intuition in the paper and relegate the modeling details in Appendix A.

In stage 1 of the game, the firm picks the levels of investment in tax and non-tax havens to maximize profit. Upon observing the investments in stage 1, the manager decides the amount to be diverted in stage 2. Investment in tax havens not only increases the firm's output but also helps the firm reduce its tax payment. However, investing in tax havens includes both the direct cost of investing in tax havens and the difficulties associated with dealing with the government, clarifying and explaining to the tax authority, the politicians, and the general public, and the

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<sup>15</sup>The U.K.'s Companies Act of 2006 requires firms to disclose the location and name of all their subsidiaries to the Companies House. ActionAid reported on February 2011 that 49 of the FTSE 100 firms did not fully disclose information about their subsidiaries. ActionAid filed a complaint at the Companies House. See <http://www.actionaid.org.uk/news-and-views/actionaid-attempts-to-lift-the-veil-of-secrecy-around-tax-havens>.

firm's potential reputation damage. Furthermore, the manager can privately benefit by diverting the resources located in tax havens. When a firm has strong corporate governance, resource diversion by the manager becomes difficult.<sup>16</sup> With other things being equal, the same amount of investment in tax havens benefits a better-governed firm.

In the subgame-perfect Nash equilibrium, the equilibrium investment level in tax havens maximizes firm value. The equilibrium level of managerial diversion, which is a function of the cost of investing in tax havens and the level of corporate governance, is taken into consideration in firm value maximization. We obtained comparative statics showing that an increase in the cost of investing in tax havens decreases firm value. Given that the report by ActionAid (2011) increases this cost, it should lower the share prices of firms. In addition, considering that better-governed firms have good checks and balances and are therefore able to prevent their managers from misusing tax haven subsidiaries to divert resources, our model predicts that these firms are affected more significantly by the increase in the cost of investing in tax havens (in absolute term, and also in relative term under a sufficient condition).

Our model considers how corporate governance standards affect the value of firms with different investment amounts in tax havens; it also suggests that the shape of the firm's production function also plays a role. To the extent that the functional form of the production function is not correlated with firm tax haven investment, our estimation of the differential effect of the event caused by corporate governance standard would not be biased. Other factors do determine a firm's production function and are thus correlated with firm tax haven investment (Desai et al. 2006b). This condition motivates us to control these other relevant factors in our estimation.

### 3. Empirical Analysis

Our event date is October 11, 2011, which is the release date of ActionAid (2011). This event induced an increase in the costs for firms to hold subsidiaries in tax havens. We measure

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<sup>16</sup>Bennedsen and Zeume (2015) documented an example in which the CFO of the fallen Enron, Andrew Fastow, established a network of 881 offshore subsidiaries, through which he and his friends managed to divert at least USD 42 million to their own accounts.

the decrease in firm value by CARs. We are aware of neither evidence suggesting that investors systematically under-estimated the firms' presence in tax havens, nor evidence showing that the market systematically mis-priced FTSE 100 firms. Therefore, rather than asserting that investors were ignorant of their firms' presence in tax havens and ActionAid (2011) informed them, we view ActionAid (2011) as giving out news on the increased likelihood that the British government and other interest groups would "get tough" on their presence in tax havens.<sup>17</sup>

### 3.1. Estimation of abnormal returns

Following Morck, Yeung, and Yu (2000), we use the following multi-factor market model to eliminate the effect of other news that would affect all stocks in the U.K. market to determine the stock price reaction to the ActionAid report.<sup>18</sup>

$$r_{it} = \alpha_i + \beta_{1i}r_{mt} + \beta_{2i}(r_{US,t} + e_{US,t}) + \beta_{3i}r_{\pounds,t} + \delta_0 E_t + \varepsilon_{it}, \quad (1)$$

where  $r_{it}$  is the stock return for firm  $i$ ;  $r_{mt}$  and  $r_{US,t}$  are the market returns in the U.K. and the U.S. at period  $t$ , respectively;  $e_{US,t}$  is the exchange rate of the British pound per U.S. dollar;  $r_{\pounds,t}$  is the return of the British pound effective exchange rate index;<sup>19</sup>  $E_t$  is a dummy indicating an event window; and  $\varepsilon_{it}$  is the error.

To measure  $r_{mt}$ , we use the average return value-weighted by market capitalizations among non-FTSE 100 U.K. firms<sup>20</sup> We include the market return in the U.S. (measured by the return of the S&P 500 Index) as a second factor because the British economy was open to foreign capital and the U.S. market might affect the returns of British firms. The expression of

<sup>17</sup>One might think that this contradicts with Dyreng et al. (2016) who find that half of the firms did not report all their subsidiaries to Companies House but subsequently did so after the report. Such an ex-ante non-compliance, however, does not automatically support the statement that investors systematically mis-infer firms' usage of tax havens. This is analogous to saying that even if firms are not filing every piece of information relevant to their businesses, say, to the SEC, that does not mean that the capital market would systematically mis-price the firms.

<sup>18</sup>A two-factor model was used by Desai and Hines (2008), but they used a more conventional two-stage approach by first running firm-specific time-series market models to obtain each firm's cumulative abnormal returns ( $CAR_i$ ) and regressing  $CAR_i$  on the variables of interests. When we adopted this two-stage approach, our results are similar

<sup>19</sup>This index is obtained from the Bank of England.

<sup>20</sup>If investors expect that using tax havens presents more troubles not only to the FTSE 100 firms but also to the non-FTSE 100 firms listed in the U.K. market, then our estimate that uses non-FTSE 100 firms as a benchmark would underestimate the effect of tax havens on firm value. Doing so also makes it more difficult for us to identify a significant effect.

$r_{US,t} + e_{US,t}$  is used to translate the return into British pounds. Including the British pound real exchange rate index as a third factor further controls for the possible effect on firms with foreign subsidiaries.

Our coefficient of interest is  $\delta_0$ . It captures the average daily abnormal return around the event period due to ActionAid (2011). Given that October 11, 2011 is day 0, the CAR within the  $[0, 1]$  event window should be  $2 \times \delta_0$ . Similarly, if we use a  $k$ -day event window in the regression, the CAR during this period would be  $k \times \delta_0$ . Given that  $\varepsilon_{it}$  in equation (1) is likely to be correlated because of the common event day affecting our sampled firms, we follow the procedure of Dube et al. (2011) to estimate a panel regression of (1) and reported the standard errors as provided by the maximum of robust standard errors, standard errors clustered by trading days, and standard errors clustered by firms.<sup>21</sup>

To test our hypothesis that the negative market reaction is stronger among the better-governed firms, the baseline market model (1) is extended as follows:

$$r_{it} = \alpha_i + \beta_{1i}r_{mt} + \beta_{2i}(r_{US,t} + e_{US,t}) + \beta_{3i}r_{\mathcal{E},t} + (\delta_0 + \delta_1 CG_i + \gamma Z_i) \times E_t + \varepsilon_{it}, \quad (2)$$

where  $CG_i$  measures the corporate governance standard of the firm and  $Z_i$  contains other control variables.

We use the governance index (Gov41) from Aggarwal, Erel, Ferreira, and Matos (2011) to measure the corporate governance standard. This index is based on 41 firm-level governance attributes covering four broad subcategories, including board of directors, auditing, anti-takeover provisions, and compensation and ownership. A high Gov41 index indicates strong corporate governance. The corporate governance measure for each firm was obtained as the average of the governance indexes between 2004 and 2008. Considering that the corporate governance standard evolves slowly over time, the average governance index is a good proxy for the corporate governance standard of the sampled firms in 2011. In the vector of covariates, we include several other firm characteristics that may be related to the firms' use of tax havens or

<sup>21</sup>The advantage of estimating abnormal return in a panel regression manner instead of the traditional firm-by-firm market-model residual approach is the flexibility in adjusting for standard error when the events are clustered (Binder 1985a,b; Smith et al. 1986).

tax avoidance (e.g., Desai et al. 2006b, Dyreng et al. 2016, Graham et al. 2014, and Bennesen and Zeume 2015) and may thus explain the market reactions. These characteristics include firm size (proxied by log of total assets), multinationality (measured by log of the number of non-tax haven countries where the firm's subsidiaries are located), inventory-to-total assets ratio, R&D-to-total assets ratio, capital expenditure-to-total assets ratio, profitability, and asset tangibility. In several specifications, we also consider firms' corporate social responsibility (CSR) based on data from the Asset4 database.<sup>22</sup> Details on these variables are provided in Appendix B.

### 3.2. *Sample construction and descriptive statistics*

We focus on non-financial firms for three major reasons.<sup>23</sup> First, British financial firms have long been closely affiliated with the City of London and were all highly regulated. Second, during and after the financial crisis, the British government nationalized a substantial amount of ownership from financial firms (Scott, 2009). The affiliation with the City of London, government ownership, and regulations specific to financial firms caused difficulties in predicting market reactions to the event. Third, financial firms had other special reasons to hold foreign subsidiaries (e.g., transacting with domestic clients' offshore businesses) that may differ from those of other types of businesses. Including them in our estimation may confound our results.

Among the 100 FTSE firms listed in ActionAid (2011), 76 were non-financial firms.<sup>24</sup> Their total market capitalization exceeded £1,000 billion.<sup>25</sup> Table 1 reports the summary statistics of the number and share of subsidiaries in tax havens for the sampled firms and other key variables. On average, a firm had approximately 307.2 subsidiaries, 72.4 of which were located in tax havens and 234.8 of which were located in non-tax havens. The average share of subsidiaries located in tax havens was about 23.9%, meaning that a firm on average had 1 out of

<sup>22</sup> Asset4 is a private firm founded in 2003 and was acquired by Thomson Reuters in 2009. They began to collect annual data on firms' environmental, social, and governance performance in 2003. This dataset has been used by Cheng et al. (2014) to study international corporate governance and social responsibility issues.

<sup>23</sup> In his empirical tax sheltering model for U.S. firms, Lisowsky (2010) also focused on non-financial firms only.

<sup>24</sup> 65 of these firms had available corporate governance measure (Gov41).

<sup>25</sup> Amihud (2002) and Amihud et al. (2005) pointed out that illiquidity is one of the most important market frictions that affect asset prices. This problem, however, should not be a serious concern among the firms in our sample.

4 of its subsidiaries located in tax havens.<sup>26</sup> Figure 1 plots the CARs of the non-financial firms in the sample from day  $-1$  to day 15. These CAR estimates were from model (1) for each firm. The average price decreased on the day of the report. The negative market reaction appeared to persist for 15 trading days.

[Table 1 and Figure 1 are about here.]

### *Firms' presence in tax havens*

What should be a measure of firms' presence in tax havens? This question would be more serious if a firm-level regression of firm value is to be conducted on firm presence in tax havens. Not only should we come up with a correct measure that is comparable across firms, we also have to tackle endogeneity. Conducting an event study alleviates these issues. However, the differences between the shares and numbers of haven subsidiaries still need to be identified.<sup>27</sup>

Using the number of tax haven subsidiaries to proxy for a firm's presence in tax havens is similar to using the number of legal entities of a jurisdiction to proxy for its economic activities, which is at best a crude measure. We therefore follow Desai et al. (2006b) and use the share of tax haven subsidiaries instead. However, the share is not without problems. We provide two arguments. First, the diagrams and tables in ActionAid (2011) and its spreadsheet file highlight the number and shares of tax haven subsidiaries for the FTSE 100 firms, suggesting that ActionAid might actually want people to focus on these measures. Second, given that interest groups (such as the government, tax authority, NGOs, and the general public) regard an unusually large share of a firm's subsidiaries located in tax havens as alarming, we believe that our event study provides something meaningful about the value tax havens attribute to firms.

Figure 2 visualizes the relation between the number of subsidiaries and both the number and share of subsidiaries located in tax havens of the sampled firms. Subfigure (a) shows a strong positive correlation between the number of subsidiaries and the number of tax haven

<sup>26</sup>The Online Appendix contains a table showing the extent to which the firms' subsidiaries were located in tax havens.

<sup>27</sup>Unlike Berkshire Hathaway's annual shareholders' meeting, a spectacular event that lasts for an entire day and exhausts the chairman (and probably the vice-chairman too), an annual shareholder meeting of a haven subsidiary may last for less than a minute. They are usually held in batches. Tax haven activities can be easily scaled up and down without necessarily increasing the number of haven subsidiaries.

subsidiaries (the slope of the fitted line is 0.257 with a  $p$ -value of  $< 0.001$ ). The firms with a large number of tax haven subsidiaries were those with many subsidiaries. Using the absolute number of tax haven subsidiaries in our event study appears to be inappropriate. Meanwhile, subfigure (b) does not show a clear relationship between the number of subsidiaries and the share of tax haven subsidiaries (the slope of the fitted line is  $-0.006 \times 10^{-3}$  with a  $p$ -value  $= 0.841$ ).<sup>28</sup>

[Figure 2 is about here.]

The number of offshore subsidiaries might also be due to previous M&As. For instance, when a firm acquires another firm with many tax haven subsidiaries, because of “inertia” of ownership, the acquirer inherits these subsidiaries and appears to be actively using tax havens. ActionAid (2011) would then give a false alarm to interest groups regarding these firms. In our model, a firm’s choice of investments in tax and non-tax havens should maximize its profit. If a firm has acquired subsidiaries through M&As and the investment amount does not maximize its value, it would benefit by adjusting the number of subsidiaries. Two pieces of evidence suggest that firms adjust their numbers of subsidiaries. Table 10 shows some summary statistics on the use of subsidiaries by the FTSE 100 firms in a follow-up report by ActionAid (2013). Comparison of the changes in the number of subsidiaries in the 2011 and 2013 lists reveals a large amount of within-firm variation in the number of subsidiaries. Bennedsen and Zeume (2015) find that after the signing of the Tax Information Exchange Agreements (TIEAs), firms responded by moving their subsidiaries from tax havens that entered the TIEAs to other havens that did not (also known as “haven hopping”).

#### *Relation between tax haven subsidiaries and firm characteristics*

We run firm-level regressions to examine the association between the share of subsidiaries located in tax havens and several firm characteristics.<sup>29</sup> Table 2 shows the association, with 1-

<sup>28</sup> The figure also shows that three firms have over 1,000 offshore subsidiaries. If these firms are excluded, a positive and statistically significant association between the number of subsidiaries and the number of tax haven subsidiaries would still be obtained; however, an insignificant association would be observed between the number of subsidiaries and the share of tax haven subsidiaries.

<sup>29</sup> The dependent variable is a fraction between 0 and 1, so we estimated a fractional Probit model (Papke and Wooldridge, 1996). The results of OLS regressions are similar.



digit SIC industry fixed-effects included and standard errors clustered at the firm level. For Column (1), we adopted the tax haven definition in ActionAid (2011) to construct the share of tax haven subsidiaries. The large shares of subsidiaries in tax havens were from firms with relatively large shares of intangible assets, inventory, R&D expenses, and low profitability.

Some may find the classification of ActionAid (2011) debatable. For instance, ActionAid (2011) considers Delaware a tax haven. Delaware was, however, a popular location for the FTSE 100 firms' subsidiaries. Reclassifying Delaware as a non-tax haven reduced the average number of subsidiaries in tax havens to about 49.1 among the FTSE 100 firms, and their share of subsidiaries in tax havens decreased to about 17.4%. We also note that different tax havens served different purposes. For instance, several tax havens offered low corporate tax rates (which might have facilitated tax avoidance activities), whereas others offered secrecy services (which might have facilitated tax evasion activities). We therefore use alternative definitions of tax havens to ensure that our main results are not affected by the manner by which ActionAid (2011) classifies jurisdictions.

In Column (2), we compute the share of tax haven subsidiaries by excluding Delaware from the ActionAid (2011) definition. In Column (3), we employ another definition of tax havens from Hines and Rice (1994) involving 41 countries and territories.<sup>30</sup> Among these tax havens, Hines and Rice (1994) further identify 7 large havens (the "Big 7"), each of which had over one million populations as of 1982. The rest are called "Dot" havens. The "Big 7" havens include Hong Kong, Ireland, Lebanon, Liberia, Panama, Singapore, and Switzerland. Desai et al. (2006b) argue that the large workforce and capital in the "Big 7" havens may provide additional operational benefits. Meanwhile, the presence of a firm in "Dot" havens is likely to elicit the attention of tax collectors. Column (4) only includes "Dot" havens. Column (5) considers "Secret" tax havens. The Tax Justice Network (TJN) regularly publishes the "Financial Secrecy Index," which ranks jurisdictions around the world that provide financial secrecy.<sup>31</sup> We use the 2011 version of the index and compute the firms' shares of subsidiaries

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<sup>30</sup>The correlation coefficient between the tax haven definition of Hines and Rice (1994) and that of ActionAid is about 0.76.

<sup>31</sup>TJN is an independent international advocacy group consisting of researchers and activists with a shared concern about tax avoidance, tax competition, and tax havens. Refer to their website at <http://www.taxjustice.net/>.

in the following havens listed among the top 10 in the index: Switzerland, Cayman Island, Luxembourg, Hong Kong, Singapore, Jersey, and Bahrain.

The results based on these alternative tax haven definitions are fairly consistent. An exception is that the use of “Secret” tax havens appears to be negatively related to firm size (proxied by log of total assets) and positively related to the multinationality measure (log of the number of non-haven countries where a firm has a subsidiary).

[Table 2 is about here.]

### 3.3. *Baseline empirical results*

We estimate models (1) and (2) by using data from 390 trading days (from day –266 to day 123). The stock returns of the firms are expressed in percentage points. In the baseline analysis, we examined the market reactions over the  $[0, 1]$  event window.

Table 3 shows the regression results. For brevity, the firm-specific intercepts and the coefficients of the market return are not presented. Columns (1) to (3) show the results of model (1) in which we interacted  $E_t$  (the dummy indicating the  $[0, 1]$  event window) with a constant so that its coefficient is the average abnormal returns over the  $[0, 1]$  event window. In Column (1), we considered all FTSE 100 firms; the coefficient  $-0.395$  is statistically significant, indicating that CAR is about  $-0.790 (= -0.395 \times 2)$  percentage points. As mentioned earlier, the financial firms were highly regulated; because of their clients, they had special needs to use foreign subsidiaries. These factors might have affected the market reaction to these firms and thus confounded the results in Column (1).<sup>32</sup> In Column (2), we focus on the 76 non-financial firms. CAR was larger (about  $-0.934 = -0.467 \times 2$  percentage points) in these firms. In Columns (3) to (5), we consider the subsample of non-financial firms with available Gov41 data. In these 65 firms, CAR was about  $-0.924 (= -0.462 \times 2)$  percentage points.

[Table 3 is about here.]

The coefficient of Gov41 in Column (4) is  $-6.941$  and is statistically significant, which means that the negative market reaction was stronger among better-governed firms. One may

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<sup>32</sup>If we estimate model (1) using the 24 financial firms, we still obtain a negative coefficient, but it is not statistically significant.

argue that this result contradicts that in the literature on CSR.<sup>33</sup> Given that better-governed firms are also more socially responsible, this result contradicts the result in the literature that firms with good CSR practices tend to be well protected against the revelation of news about the poor practices of firms. To address this concern, we add the overall social responsibility measure from Asset4 as another covariate. The regression results are shown in Column (5).<sup>34</sup> In this specification, the coefficient of Gov41 is still negative and statistically significant, suggesting that our results are still similar even when CSR is considered.<sup>35</sup>

In terms of economic significance, the decline of 0.9 percentage points in CAR was equivalent to a drop of roughly £9 billion in market capitalization.<sup>36</sup> Supposing that the corporate governance standard of a firm increased from the first quartile (0.524) to the third quartile (0.580), the estimate suggests a more negative CAR by  $0.76 [= 2 \times (-6.766) \times (0.580 - 0.524)]$  percentage points. This figure corresponds to about £7.6 billion in market capitalization. One way to interpret this amount is that it would have been the additional agency cost of managerial rent diversion associated with the use of tax havens if a firm at the first quartile of the corporate governance measure was suddenly rated at the third quartile instead.

How much was £9 billion? Through the use of tax havens, firms can reduce taxes payable to the U.K. government and/or other governments. To provide readers a sense of the scale of the tax payable, we assumed that all of the £9 billion was collected by the U.K. tax authority. According to the U.K. Budget 2011,<sup>37</sup> the total tax revenue was about £589 billion. Therefore, the drop in market capitalization by the sampled firms following the release of the ActionAid report was roughly 1.5% ( $= 9/589$ ) of the tax revenue in 2011.

<sup>33</sup>Please see Vanhamme and Grobben (2009) and Godfrey (2005).

<sup>34</sup>In this specification, only 63 firms with available data are included. Consistent with the literature, the coefficient of the overall social responsibility measure is positive but not significant, suggesting that good CSR tends to offer firms good protection against bad news.

<sup>35</sup>Another possibility is that our main results are driven by the governance measure we used. Alternatively, we used the corporate governance score from Asset4 and re-estimated the regressions in Columns (4) and (5). Our regression results are similar. For brevity, these results are not reported but are available upon request.

<sup>36</sup>The total market capitalization of the sampled firms was about £1,000 billion.

<sup>37</sup>See [http://cdn.hm-treasury.gov.uk/2011budget\\_complete.pdf](http://cdn.hm-treasury.gov.uk/2011budget_complete.pdf).

### 3.4. Robustness checks

We perform several robustness checks. First, we examine market reactions before and after the event. On the one hand, the news might have leaked out early because ActionAid, being an NGO, was not legally obliged to maintain secrecy about its future report release. On the other hand, our baseline results do not capture any delayed market reactions to the report. To investigate these two issues, we re-estimate the regression model in (1) for several pre-event and post-event windows. The results are presented in Table 4. Panel (A) shows the results using the following pre-event windows:  $[-20, -1]$ ,  $[-10, -1]$ , and  $[-2, -1]$ . In all these windows, the coefficients of average abnormal return are all statistically insignificant. Panel (B) shows the results using the following post-event windows:  $[1, 2]$ ,  $[1, 10]$ , and  $[1, 20]$ . Similarly, the coefficients of average abnormal return are all statistically insignificant. Therefore, no evidence exists to support the possibilities of news leaking before the event and delayed market reactions afterward.

[Table 4 is about here.]

In the baseline regressions, we used an event window of  $[0, 1]$ . Another concern is that the market might have over-reacted to the event within this short window. Did the market reactions persist over time? Figure 1 shows a negative CAR up to 15 trading days. We also estimate model (1) using wider event windows from  $[0, 2]$  up to  $[0, 5]$ . The regression results, shown in Table 5, indicate that the negative market reactions persisted up to four trading days after the event. The coefficient of average abnormal return in the  $[0, 4]$  event window is  $-0.315$ , suggesting that CAR is about  $-1.575 = (-0.315 \times 5)$  percentage points. If wider event windows are used, precisely measuring the market reactions to the event may be difficult (MacKinlay 1997), as can be seen from the relatively large standard errors.

[Table 5 is about here.]

We also perform a placebo test on matched French and German firms. The matched firms are listed in French CAC and German DAX with a similar firm size, leverage, and corporate governance score. These firms were not directly affected by ActionAid (2011) and should not

exhibit similar abnormal price movement patterns as our sampled firms. We use different event windows around the key event date and did not find any statistically significant market reactions from these matched firms. We also conduct another robustness check to estimate the abnormal returns for the non-financial FTSE 250 firms using the same market model used in the baseline analysis, in which the “market” excludes both FTSE 100 and FTSE 250 firms. For the [0, 1] event window, we find no significant negative reactions among these FTSE 250 firms to the ActionAid report.<sup>38</sup>

### 3.5. *Did the firms register abnormal returns because of their tax haven subsidiaries?*

The empirical results presented in the previous sections support the view that FTSE 100 firms registered negative CARs because of the ActionAid report. Considering that the negative market reactions were driven by investors’ expectation of the increasing cost of holding subsidiaries in tax havens, firms that located a larger share of their subsidiaries in tax havens should experience a larger decrease in price.

To analyze whether the market reacted differently for different firms, we divide the sampled firms according to the median share of subsidiaries located in tax havens and re-estimate model (1) separately for each of the subsamples. We also use different definitions of tax havens. Table 6 shows our findings. The tax haven definition used in Panel (A) is the original definition according to ActionAid (2011). In Panel (B), we remove Delaware from the list of tax havens. In Panel (C), we use the definition of tax havens provided by Hines and Rice (1994). In Panels (D) and (E), we focus on “Dot” and “Secret” havens, respectively.

In the table, the cells in Columns (1) and (2) represent the coefficient of the average abnormal return in model (1) for firms with below-median and above-median shares of subsidiaries located in tax havens. In all these regressions, the market reaction was stronger among firms with above-median shares of subsidiaries located in tax havens.<sup>39</sup> For instance, among the firms with below-median shares of tax haven subsidiaries (according to the definition of ActionAid 2011), CAR over the [0, 1] event window was  $-0.804 (= -0.402 \times 2)$  percentage

<sup>38</sup>For brevity, these results are not reported but are available upon request.

<sup>39</sup>If we divide the firms according to the shares of subsidiaries in the “Big 7” tax havens, we will find that CAR was more negative among above-median firms.

points, whereas that among the above-median firms was  $-1.052 (= -0.526 \times 2)$  percentage points.

[Table 6 is about here.]

In Table 6, the share of haven subsidiaries are computed with the total number of subsidiaries as the denominator. To what extent are these results driven by this denominator? In other words, when the interest groups calculated which firms to first pick on, they might have concentrated on firms with substantially high shares of subsidiaries located at notorious tax havens relative to either the total number of foreign (i.e., non-U.K.) subsidiaries or the number of total haven subsidiaries as defined in ActionAid (2011). Table 7 shows that firms with large shares of subsidiaries located at “Dot” and “Secret” tax havens, out of either the total number of tax haven subsidiaries defined in ActionAid (2011) (Panels (A) and (B)) or the total number of foreign subsidiaries (Panels (C) and (D)), registered more negative CARs. In sum, the report caused the firms to register negative CARs, and the drop was likely caused by their tax haven subsidiaries.

[Table 7 is about here.]

Did better-governed firms experience a larger drop than poorly governed firms simply because they had relatively more to lose? If so, the market should have reacted negatively irrespective of the firm’s shares of subsidiaries in tax havens. To investigate this issue, we divide the sampled firms according to the median share of subsidiaries located in tax havens and re-estimated model (2) for each of the subsamples. Similarly, we use different definitions of tax havens for these subsample regressions. Table 8 presents the results. Stronger corporate governance was significantly associated with a larger drop only among firms that held relatively more subsidiaries in tax havens. By contrast, among firms that held relatively fewer tax haven subsidiaries, the association between corporate governance standard and market reaction was statistically insignificant. These findings are inconsistent with the claim that better-governed firms have a larger drop than poorly governed firms simply because they have more to lose.

[Table 8 is about here.]

### 3.6. *Plausible channels*

We showed that ActionAid (2011) caused the non-financial FTSE 100 firms to register negative CARs, especially those with large shares of tax haven subsidiaries. What were the plausible channels? We examine the following four channels.

#### *Consumer boycott*

Consumers might have become less willing to buy from these firms because of ActionAid (2011). Ex ante, at the time ActionAid (2011) was published, shareholders may not know whether a boycott would occur and if it does, how long it may last and how severe the effect may be on the firms. Therefore, one may argue that ActionAid (2011) caused a negative market reaction because shareholders anticipate a potential consumer boycott in the future, which may affect future profitability. If this was a significant channel, more negative CARs are to be expected for firms engaging in business-to-consumer (B-to-C) businesses rather than those in business-to-business (B-to-B) businesses. To investigate this issue, we single out firms in retail industries (i.e., those with 2-digit SIC between 52 and 59). Only 8 such firms were identified out of the 76 non-financial firms. In an unreported analysis, we find negative yet statistically insignificant market reactions to these 8 firms. Nevertheless, the lack of statistical significance could also be due to the small sample size (MacKinlay, 1997). We are not convinced that we have sufficient evidence in support of this channel.

#### *Reputation*

ActionAid (2011) might have directly damaged the reputation of firms. If reputation was a significant channel, more negative CARs would be observed among firms with high reputation capital. This is also a challenging channel to test because no universal and objective measure of firm reputation exists.

We test this channel in two indirect ways. First, we exploit the possibility that firms that have successfully built up high reputation capital appear socially responsible. We use two measures of social responsibility from the Asset4 database. The first one measures the overall social responsibility of the firm, and the second one specifically measures the firms' reputation

within the general community.<sup>40</sup> We then divide the firms into subgroups according to these two measures and estimate the CARs for the firms in different subgroups. The regression results are presented in Panels (A) and (B) of Table 9. In both panels, the market reactions to firms with a high social responsibility score or awareness of reputation are more negative. These results are consistent with the view that ActionAid (2011) directly damaged firms' reputation.

Second, Graham et al. (2014) suggest that large firms are very concerned about their reputation. We therefore use firm size as a proxy for reputation capital, with the knowledge that a firm with a bad reputation can still possibly be very concerned about its reputation. We divide the firms into large and small firms (according to total assets) and estimated the CARs for the firms in different subgroups. Panel (C) of Table 9 shows that the market reaction to the small firms was more negative than that to the large firms.<sup>41</sup>

To the extent that the firms that were very concerned about reputation were those that had built up much reputation capital, these results are against the claim that ActionAid (2011) directly damaged the reputation of firms. However, if "concern about reputation" does not correlate with reputation capital strongly, our results will not contradict those of social responsibility measures in Panels (A) and (B). These results also suggest that better-governed firms experienced a larger drop not because they were large, which is consistent with Table 8. Altogether, we have some but not strong evidence that ActionAid (2011) might have directly damaged the reputation of firms.

#### *Government scrutiny*

ActionAid (2011) might have successfully triggered investors to believe that firms using tax havens are likely to be penalized or heavily investigated by the government and the HMRC,

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<sup>40</sup>The first measure is the SOCSCORE variable, which measures "a company's capacity to generate trust and loyalty with its workforce, customers, and society through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long-term shareholder value." The second measure is the SOCO variable, which "measures a company's management commitment and effectiveness toward maintaining the company's reputation within the general community (local, national, and global). It reflects a company's capacity to maintain its license to operate by being a good citizen (donations of cash, goods, staff time, etc.), protecting public health (avoidance of industrial accidents, etc.) and respecting business ethics (avoiding bribery and corruption, etc.)." Both definitions are according to ASSET4 documentations.

<sup>41</sup>We get similar results when we measure firm size by the number of offshore subsidiaries owned by these firms.



which were the aims of the report. If the government and the HMRC did pick on these firms, those that had many subsidiaries in tax havens, especially the notorious ones, are likely to be first to be picked on.

Table 6 shows the more negative market reactions among the firms with larger shares of their subsidiaries located in tax havens, where tax havens are defined in five different ways. Table 7 shows that the pattern persisted even when we compute the shares of subsidiaries located in “Dot” and “Secret” havens out of either the total haven subsidiaries or the foreign subsidiaries. As suggested by Desai et al. (2006b), “Dot” havens provide a few operational benefits to firms and are thus likely to be associated with tax-avoidance activities. Meanwhile, “Secret” havens provide financial secrecy that might facilitate tax evasion. Firms with numerous subsidiaries in “Dot” or “Secret” havens are likely to attract the attention of the government and HMRC and face an increased likelihood of investigation. The fact that these firms registered more negative CARs is consistent with the following view: that ActionAid (2011) triggered the investors to expect that the authorities would “toughen” their actions on these firms.

#### *Investor sentiment*

Finally, ActionAid (2011) might have disgusted some investors by indirectly increasing their future financing costs. If this was true, stronger market reactions would be observed among firms that have a high level of retail investor ownership. Given that we do not have any direct measure of retail investor ownership of the FTSE 100 firms, we could not test this channel directly. Instead, we use a measure of institutional ownership concentration — the Herfindahl-Hirschman Index (HHI) of institutional ownership — from FactSet Ownership (LionShares) (see Ferreira and Matos 2008).<sup>42</sup> A higher value of HHI indicates that ownership by institutional investors is more concentrated; in contrast, a lower value indicates that ownership is more diverse.<sup>43</sup> However, a firm with a low HHI does not necessarily have a high level of retail investor ownership. To the extent that this was the case, if investors’ negative reactions following ActionAid (2011) were indeed relevant, we should expect stronger market reactions toward these

<sup>42</sup>We did not use such measures as total share of institutional ownership because they may be a proxy for the corporate governance standards of the firms.

<sup>43</sup>Among the sampled firms with available data, the correlation between HHI of institutional ownership and the total share of institutional ownership is  $-0.006$  with a  $p$ -value =  $0.966$ .

firms with a low HHI.

Panel (D) of Table 9 shows the results. Among firms with a low HHI, the implied CAR over the  $[0, 1]$  window was  $-1.156$  percentage points, whereas among firms with high HHI, the implied CAR over the  $[0, 1]$  window was  $-0.708$  percentage points. The stronger market reaction toward the firms with a low HHI provides some support to the claim that ActionAid (2011) disgusted some investors.

[Table 9 is about here.]

Overall, we obtain some evidence suggesting that ActionAid (2011) damaged the reputation of firms, created the expectation that government penalty would be applied, and disgusted several investors through the news regarding these firms.<sup>44</sup>

#### **4. Aftermath: Updated List of Subsidiaries Held by the FTSE 100 Firms in ActionAid (2013)**

On May 23, 2013, ActionAid (2013) published a press release entitled “Almost Half of All Investment Into Developing Countries Goes Through Tax Havens, ActionAid reveals.” This press release came with an updated list of subsidiaries owned by the FTSE 100 firms in a similar format as that in ActionAid (2011). ActionAid began updating in September 2012 by using the most updated information available in 2011 and 2012.<sup>45</sup> We compare the use of tax havens by the firms between 2011 and 2013; the analysis suggests that the ActionAid report (and the subsequent changes in the news coverage) could be associated with the firms’ adjustments in the use of offshore subsidiaries.

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<sup>44</sup> Another plausible channel is that the firms are required to reorganize their activities which may be costly and lead to higher tax payments in the future. Indeed, as we will show in the next section, firms do change the locations of subsidiaries between tax havens and non-tax havens between 2011 and 2013. However, we are unable to come up with a direct measure of such a cost, precluding us from directly testing this potential channel.

<sup>45</sup> The updated list is downloadable at: [http://www.actionaid.org.uk/sites/default/files/publications/actionaid\\_ftse100\\_subsidary\\_data\\_20122013\\_final\\_final\\_for\\_website.xlsx](http://www.actionaid.org.uk/sites/default/files/publications/actionaid_ftse100_subsidary_data_20122013_final_final_for_website.xlsx).

#### 4.1. Descriptive statistics

We found 64 of the 76 non-financial firms in the 2011 list in the 2013 list. Panel (A) of Table 10 shows the summary statistics for the use of subsidiaries of these firms according to the 2013 list. Comparison of the summary statistics reported in Table 1 shows that on the average, not much change occurred in the number of subsidiaries located in tax and non-tax havens and the share of subsidiaries located in tax havens (according to different definitions). However, a large amount of within-firm variation occurred over time, as shown in Panel (B) of Table 10, in which we computed the changes in the use of subsidiaries. For instance, several firms removed as many as 80 subsidiaries in tax havens, whereas others increased theirs by as many as 45. In terms of the share of subsidiaries in tax havens, several firms reduced their share by 20 percentage points, whereas others increased theirs by 9 percentage points.

As shown in Table 11, we further examine the correlations between the changes in the use of subsidiaries with CAR over the  $[0, 1]$  event window and the changes in negative news coverage of these firms' tax-avoidance activities. This table shows that a positive correlation of 0.258 exists between the change in the share of subsidiaries in tax havens and CAR, and the correlation is statistically significant. Firms experiencing a larger drop in CAR reduce relatively more of their shares of tax haven subsidiaries. A positive correlation also exists between the change in the number of subsidiaries in tax havens and CAR, but the correlation is not statistically significant. Negative and statistically significant correlations exist between the changes in negative news coverage and the changes in numbers of subsidiaries in total in both tax and non-tax havens.

[Tables 10 and 11 are about here.]

Figure 3 shows the relationship between the changes in the use of subsidiaries located in "Dot" or "Secret" havens (on the horizontal axis) and the changes in the use of subsidiaries located in other havens (on the vertical axis) between 2011 and 2013. Subfigures (a) and (b) show the changes in the numbers and shares of subsidiaries, respectively. Both figures show a negative relationship between the two variables. The slope of the fitted line in subfigure (a) is  $-0.031$  ( $p$ -value = 0.263) and that in subfigure (b) is  $-0.234$  ( $p$ -value = 0.035). Overall,

a substitution pattern appears to exist: firms move their subsidiaries from “Dot” and “Secret” havens into “acceptable” tax havens.

[Figure 3 is about here.]

#### 4.2. *Did the market respond to ActionAid (2013)?*

With a similar market model as that in (1), we estimate the market reactions to ActionAid (2013) over the  $[0, 1]$  window (day 0 is May 23, 2013). Table 12 presents the empirical results. As shown in Column (1), CAR over  $[0, 1]$  is about  $-0.076 (= -0.038 \times 2)$  percentage points; however, it is statistically insignificant. Columns (2) to (9) reveal whether heterogeneous effects exist in terms of the firms’ changes in the use of subsidiaries (absolute numbers and shares) indicated by the 2011 and 2013 reports. We find that firms with larger increases in the number and share of subsidiaries located in tax havens have more negative CARs, although these coefficients are all statistically insignificant.

[Table 12 is about here.]

#### 4.3. *Which firms reduced or increased their tax haven use?*

As shown in Panel B of Table 10, between 2011 and 2013, several firms reduced their number of subsidiaries located in tax havens, whereas others did the opposite. Did the former firms have the largest negative CARs in 2011? Table 11 shows that a positive and significant correlation exists between the price response to ActionAid (2011) and the subsequent change in the share of subsidiaries located in tax havens. Table 13 shows the five firms with the largest CARs (“top 5”) and another five firms with the smallest CARs (“bottom 5”) during the  $[0, 1]$  event window in 2011. The changes in the use of subsidiaries by these firms are also indicated. Although no clear pattern was observed among these firms in terms of changes in the number of subsidiaries, a reduction in the share of subsidiaries in tax havens was observed among the bottom five firms.

We also examine whether firms that reduced their tax haven use derived the least benefit from having them or whether their reputations (and thus the potential for damage) were greater. We define two groups: Group 1 contains firms that decreased the shares of subsidiaries in

“Dot” or “Secret” havens and increased the shares of subsidiaries in other tax havens. Group 2 contains firms that increased the shares of subsidiaries in “Dot” or “Secret” havens and decreased the shares of subsidiaries in other tax havens. Firms that increased or decreased both types were excluded in this definition. In Table 14, we compared CAR[0, 1] in 2011 and the social responsibility score in 2010 and found that Group 1 has a significantly lower CAR[0, 1] and a lower (insignificantly) social responsibility score than Group 2. This result means that firms attempting to transfer from “Dot” or “Secret” havens to “acceptable” tax havens were likely to be hit more severely or acquire low “reputation” as of 2011.

[Tables 13 and 14 are about here.]

## 5. Conclusion

We exploited the release of a report by ActionAid, a non-governmental organization in the U.K., on tax haven subsidiaries held by the FTSE 100 firms on October 11, 2011 to investigate whether tax havens are a treasure to firms. We argued that against the overall political background around that time, the timely release of ActionAid’s report substantially increased the cost of holding tax haven subsidiaries among the FTSE 100 firms. Our event study indicated that the market reacted negatively to the release of the report, especially among the better-governed firms. The effects were stronger among firms with a noticeable presence in tax havens.

The British government spent about £917 million to tackle tax avoidance, evasion, and fraud in 2010 (HMRC, 2012); perhaps a substantial fraction of it concerned tax havens. How much did the spending reduce the firms’ presence in tax havens? How much did the shareholders of the firms suffer? The follow-up report by ActionAid in 2013 suggests that the reduction of these firms’ tax haven presence was at best marginal. Meanwhile, our study helps address the second question. Another difficult question to address is how much tax revenue the U.K. government could get back after spending £917 million. We believe that additional studies have to be conducted to address this issue.

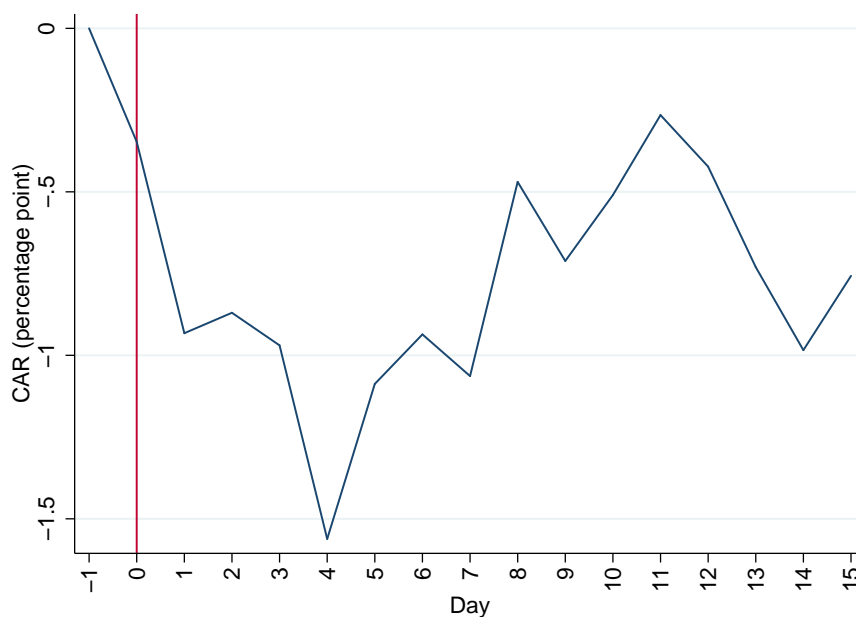
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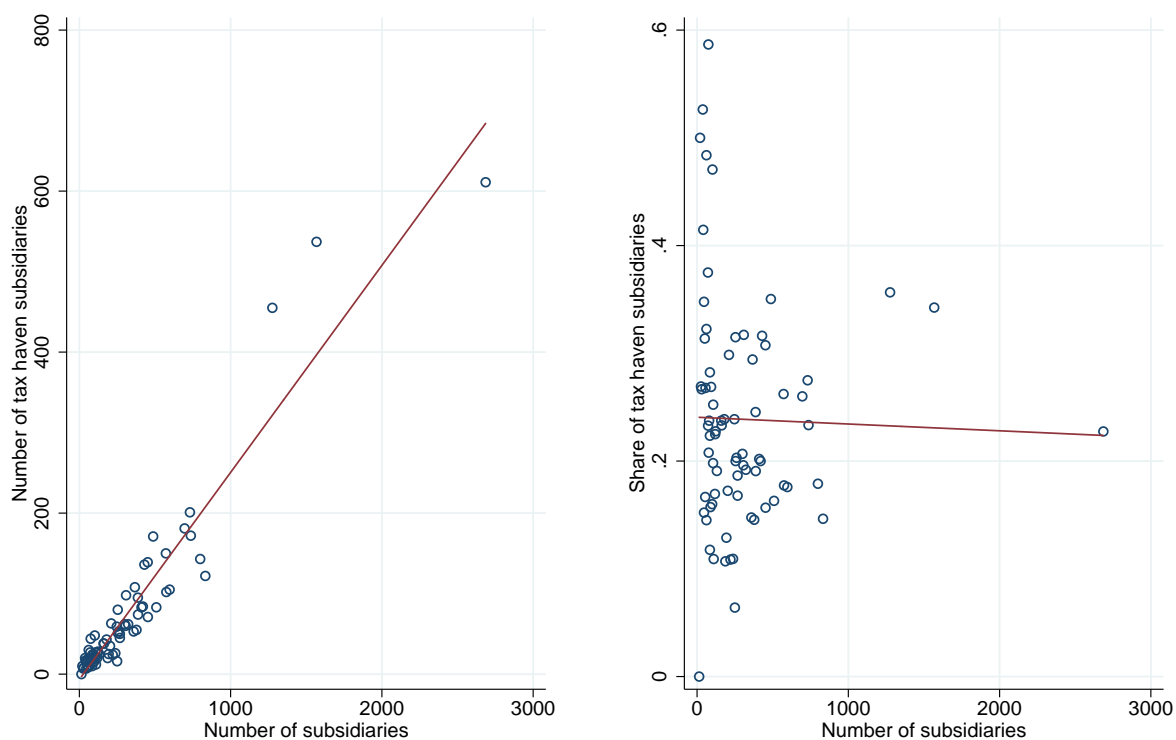
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**Figure 1: Cumulative Abnormal Returns Around the Event Date (Day 0 = October 11, 2011) for the Non-financial Firms ( $N = 76$ )**



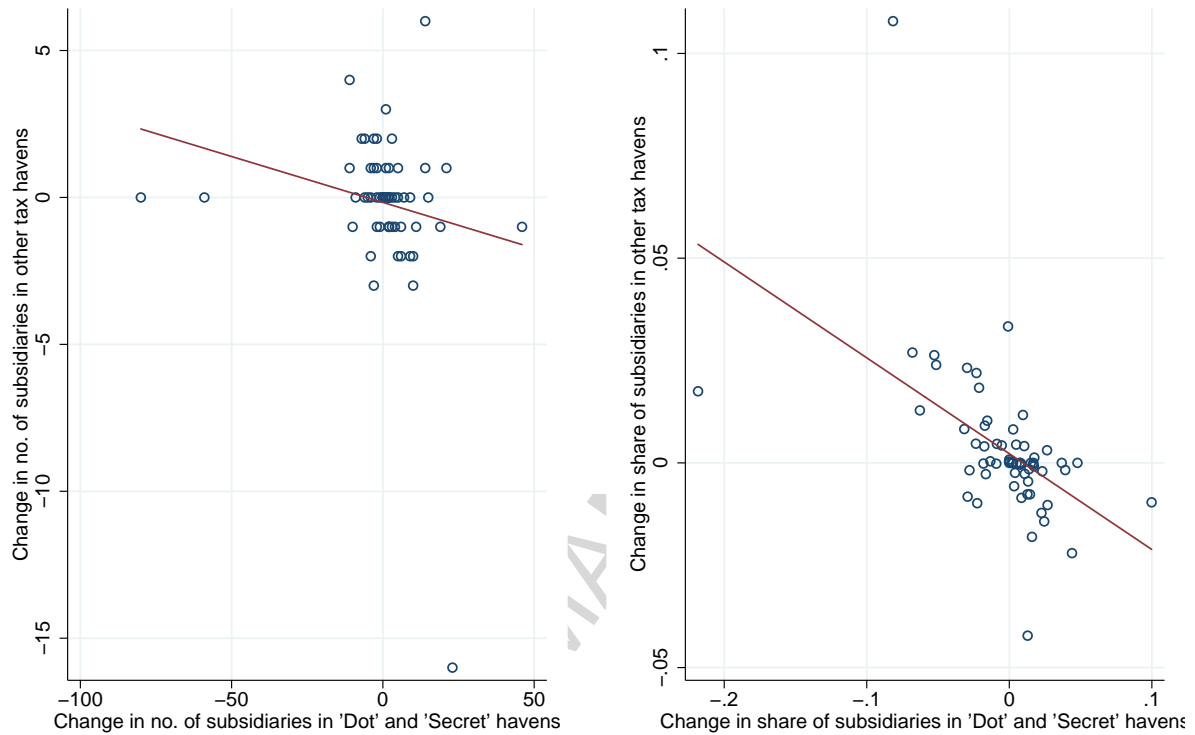
**Figure 2: Relationship Between Number of Subsidiaries and Tax Haven Use**



(a) Number of subsidiaries versus number of tax haven subsidiaries

(b) Number of subsidiaries versus share of tax haven subsidiaries

**Figure 3: Relationship Between Changes in the Use of “Dot” and “Secret” Havens and Changes in the Use of Other Havens**



(a) Changes in the number of subsidiaries in “Dot” and “Secret” havens versus changes in the number of subsidiaries in other tax havens

(b) Changes in the share of subsidiaries in “Dot” and “Secret” havens versus changes in the share of subsidiaries in other tax havens

**Table 1: Summary Statistics for the Non-financial Firms**

Variable	Mean	S.D.	Min.	1st Quartile	Median	3rd Quartile	Max.
Number of subsidiaries	307.224	393.092	14.000	82.500	198.500	387.500	2686.000
— in tax havens	72.395	106.176	0.000	19.000	38.000	83.000	611.000
— in non-tax havens	234.829	293.815	10.000	61.000	167.500	309.500	2075.000
% of subsidiaries in tax havens	0.239	0.106	0.000	0.169	0.226	0.288	0.587
Corporate governance (Gov41)	0.552	0.043	0.439	0.524	0.556	0.580	0.639
log (Total assets)	9.229	1.339	6.989	8.072	9.129	10.168	12.684
Multinationality	3.027	0.974	0.000	2.197	3.113	3.892	4.691
Leverage	0.576	0.184	0.074	0.426	0.616	0.708	0.917
Intangible assets	0.240	0.208	0.000	0.058	0.190	0.430	0.812
Inventory	0.070	0.067	0.000	0.012	0.051	0.102	0.225
R&D	0.011	0.027	0.000	0.000	0.000	0.003	0.132
Capital expenditure	0.053	0.046	0.003	0.019	0.040	0.073	0.206
Profitability	0.150	0.078	-0.052	0.101	0.137	0.185	0.397
Asset tangibility	0.327	0.256	0.000	0.110	0.249	0.544	0.886
Corporate social responsibility	85.536	12.136	39.740	84.170	89.940	93.690	96.820

Note:  $N = 76$ , except for the Corporate governance measure where  $N = 65$  and for the Corporate social responsibility measure where  $N = 63$ .

**Table 2: Relationship between Tax Haven Use and Firm Characteristics**

	(1)	(2)	(3)	(4)	(5)
Tax haven definition:	ActionAid (2011)	ActionAid (2011) excluding Delaware	Hines and Rice (1994)	“Dot” havens	“Secret” havens
log (Total assets)	0.007 (0.034)	−0.008 (0.033)	−0.046 (0.039)	−0.008 (0.038)	−0.134** (0.052)
Multinationality	−0.015 (0.058)	−0.012 (0.049)	−0.023 (0.050)	−0.011 (0.063)	0.117** (0.052)
Leverage	0.263 (0.269)	0.283 (0.297)	0.371 (0.286)	0.215 (0.284)	0.320 (0.324)
Intangible assets	0.574* (0.348)	0.816** (0.361)	1.015*** (0.338)	0.535 (0.409)	0.765** (0.335)
Inventory	1.377** (0.692)	1.854** (0.765)	2.638*** (0.912)	0.640 (0.859)	2.486** (1.010)
R&D	2.774** (1.339)	1.601 (1.269)	2.804* (1.580)	1.710 (1.275)	2.346** (1.084)
Capital expenditure	2.152** (1.093)	3.740*** (1.169)	1.818 (1.864)	2.563** (1.151)	2.821 (1.992)
Profitability	−1.389** (0.562)	−1.586*** (0.539)	−1.058 (0.676)	−1.769*** (0.609)	−1.419* (0.767)
Asset tangibility	0.145 (0.211)	0.243 (0.224)	0.655*** (0.251)	0.191 (0.251)	0.531** (0.259)
Observations	76	76	76	76	76
Log likelihood	−28.389	−24.109	−20.027	−25.207	−13.215

Note: The dependent variable is the share of subsidiaries in tax havens. The regressions are fractional Probit models. In the regressions, 1-digit SIC industry fixed-effects are included. “Dot” havens are those havens that are not “Big 7” (Hong Kong, Ireland, Lebanon, Liberia, Panama, Singapore, and Switzerland) according to Hines and Rice (1994). “Secret” havens are those havens in top 10 of the Financial Secrecy Index (2011 version) compiled by the Tax Justice Network. Standard errors are clustered by firms. \*: significance at 10% level; \*\*: significance at 5% level; \*\*\*: significance at 1% level.

**Table 3: Market Reactions: Main Regression Results**

	(1)	(2)	(3)	(4)	(5)
Sample:	All firms	Non-financial	Non-financial & with Gov41 data		
Average abnormal return	−0.395*** (0.108)	−0.467*** (0.113)	−0.462*** (0.153)	2.632* (1.528)	3.421** (1.657)
Corporate governance (Gov41)				−6.766** (3.010)	−7.165** (3.135)
log (Total assets)				−0.023 (0.089)	−0.043 (0.085)
Multinationality				0.296** (0.123)	0.290** (0.125)
Leverage				−0.260 (0.834)	−0.312 (0.868)
Intangible assets				−0.447 (1.003)	−0.780 (1.020)
Inventory				−0.838 (1.868)	−1.157 (1.789)
R&D				−6.396 (7.023)	−6.177 (6.411)
Capital expenditure				−8.672* (4.640)	−7.107 (4.991)
Profitability				3.896 (3.864)	2.761 (3.111)
Asset tangibility				0.531 (0.617)	0.126 (0.729)
Corporate social responsibility					0.003 (0.010)
Observations	38737	29377	25250	25250	24470
Number of firms	100	76	65	65	63
R <sup>2</sup>	0.441	0.424	0.429	0.429	0.438

Note: The event window is [0, 1]. Standard errors are given by the maximum of robust standard errors, standard errors clustered by trading days, and standard errors clustered by firms. \*: significance at 10% level; \*\*: significance at 5% level; \*\*\*: significance at 1% level.

**Table 4: Robustness Checks: Abnormal Returns Before and After Event**

Panel (A): Abnormal returns before event				
	(1)	(2)	(3)	
Event window:	[−20, −1]	[−10, −1]	[−2, −1]	
Average abnormal return	0.172 (0.142)	0.284 (0.203)	−0.121 (0.083)	
Observations	29377	29377	29377	
Number of firms	76	76	76	
$R^2$	0.424	0.424	0.424	

Panel (B): Abnormal returns after event				
	(1)	(2)	(3)	
Event window:	[1, 2]	[1, 10]	[1, 20]	
Average abnormal return	−0.261 (0.230)	−0.018 (0.121)	−0.066 (0.097)	
Observations	29377	29377	29377	
Number of firms	76	76	76	
$R^2$	0.424	0.424	0.424	

Note: Standard errors are given by the maximum of robust standard errors, standard errors clustered by trading days, and standard errors clustered by firms. \*: significance at 10% level; \*\*: significance at 5% level; \*\*\*: significance at 1% level.

**Table 5: Robustness Checks: Wider Event Windows**

	(1)	(2)	(3)	(4)
Event window:	[0, 2]	[0, 3]	[0, 4]	[0, 5]
Average abnormal return	−0.291* (0.157)	−0.245* (0.127)	−0.315*** (0.119)	−0.186 (0.154)
Observations	29377	29377	29377	29377
Number of firms	76	76	76	76
$R^2$	0.424	0.424	0.424	0.424

Note: Standard errors are given by the maximum of robust standard errors, standard errors clustered by trading days, and standard errors clustered by firms. \*: significance at 10% level; \*\*: significance at 5% level; \*\*\*: significance at 1% level.

**Table 6: Differential Market Reactions By Tax Haven Use**

Panel (A): Tax haven definition according to ActionAid (2011)		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.387*** (0.140)	−0.547*** (0.182)
Observations	14720	14657
Number of firms	38	38
$R^2$	0.405	0.440
Panel (B): Tax haven definition according to ActionAid (2011) excluding Delaware		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.330** (0.160)	−0.604*** (0.171)
Observations	14720	14657
Number of firms	38	38
$R^2$	0.422	0.426
Panel (C): Tax haven definition according to Hines and Rice (1994)		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.451** (0.196)	−0.484*** (0.171)
Observations	14720	14657
Number of firms	38	38
$R^2$	0.388	0.463
Panel (D): “Dot” havens		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.327** (0.141)	−0.607*** (0.181)
Observations	14720	14657
Number of firms	38	38
$R^2$	0.406	0.439
Panel (E): “Secret” havens		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.414*** (0.152)	−0.520*** (0.168)
Observations	14720	14657
Number of firms	38	38
$R^2$	0.445	0.402

Note: Each cell represents the coefficient of the average abnormal return in model (1). The event window is [0, 1]. “Below median” and “Above median” are the samples of firms with below-median and above-median shares of subsidiaries located in tax havens. “Dot” havens are those havens that are not “Big 7” (Hong Kong, Ireland, Lebanon, Liberia, Panama, Singapore, and Switzerland) according to Hines and Rice (1994). “Secret” havens are those havens in top 10 of the Financial Secrecy Index (2011 version) compiled by the Tax Justice Network. Standard errors are given by the maximum of robust standard errors, standard errors clustered by trading days, and standard errors clustered by firms. \*: significance at 10% level; \*\*: significance at 5% level; \*\*\*: significance at 1% level.

**Table 7: Differential Market Reactions By the Shares of “Dot” and “Secret” Tax Havens Subsidiaries**

Panel (A): By share of “Dot” haven subsidiaries out of total haven subsidiaries		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.310** (0.134)	−0.572*** (0.181)
Observations	14557	14430
Number of firms	38	37
$R^2$	0.394	0.455
Panel (B): By share of “Secret” haven subsidiaries out of total haven subsidiaries		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.372** (0.156)	−0.508*** (0.159)
Observations	14557	14430
Number of firms	38	37
$R^2$	0.448	0.403
Panel (C): By share of “Dot” haven subsidiaries out of total foreign subsidiaries		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.354** (0.134)	−0.587*** (0.181)
Observations	14947	14430
Number of firms	39	37
$R^2$	0.434	0.414
Panel (D): By share of “Secret” haven subsidiaries out of total foreign subsidiaries		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.350** (0.152)	−0.577*** (0.166)
Observations	14820	14557
Number of firms	38	38
$R^2$	0.479	0.365

Note: Each cell represents the coefficient of the average abnormal return in model (1). The event window is [0, 1]. “Below median” and “Above median” are the samples of firms with below-median and above-median values of the corresponding firm characteristic. “Dot” havens are those havens that are not “Big 7” (Hong Kong, Ireland, Lebanon, Liberia, Panama, Singapore, and Switzerland) according to Hines and Rice (1994). “Secret” havens are those havens in top 10 of the Financial Secrecy Index (2011 version) compiled by the Tax Justice Network. Standard errors are given by the maximum of robust standard errors, standard errors clustered by trading days, and standard errors clustered by firms. \*: significance at 10% level; \*\*: significance at 5% level; \*\*\*: significance at 1% level.

**Table 8: Do Better Governed Firms Have More to Lose?**

Panel (A): Tax haven definition according to ActionAid (2011)		
	(1)	(2)
	Below median	Above median
Corporate governance (Gov41)	-3.745 (3.832)	-12.261** (5.757)
Observations	13550	11700
Number of firms	35	30
$R^2$	0.410	0.449
Panel (B): Tax haven definition according to ActionAid (2011) excluding Delaware		
	(1)	(2)
	Below median	Above median
Corporate governance (Gov41)	-2.615 (3.784)	-10.940** (4.293)
Observations	13550	11700
Number of firms	35	30
$R^2$	0.430	0.428
Panel (C): Tax haven definition according to Hines and Rice (1994)		
	(1)	(2)
	Below median	Above median
Corporate governance (Gov41)	-0.198 (4.990)	-10.844*** (4.034)
Observations	13160	12090
Number of firms	34	31
$R^2$	0.381	0.483
Panel (D): "Dot" havens		
	(1)	(2)
	Below median	Above median
Corporate governance (Gov41)	-1.479 (3.708)	-9.678** (4.376)
Observations	13160	12090
Number of firms	34	31
$R^2$	0.418	0.441
Panel (E): "Secret" havens		
	(1)	(2)
	Below median	Above median
Corporate governance (Gov41)	-1.931 (4.209)	-6.807 (5.895)
Observations	12870	12380
Number of firms	33	32
$R^2$	0.444	0.415

Note: Each cell represents the coefficient of the corporate governance measure in model (2). The event window is [0, 1]. "Below median" and "Above median" are the samples of firms with below-median and above-median shares of subsidiaries located in tax havens. "Dot" havens are those havens that are not "Big 7" (Hong Kong, Ireland, Lebanon, Liberia, Panama, Singapore, and Switzerland) according to Hines and Rice (1994). "Secret" havens are those havens in top 10 of the Financial Secrecy Index (2011 version) compiled by the Tax Justice Network. Standard errors are given by the maximum of robust standard errors, standard errors clustered by trading days, and standard errors clustered by firms. \*: significance at 10% level; \*\*: significance at 5% level; \*\*\*: significance at 1% level.



**Table 9: Differential Market Reactions By Different Firm Characteristics**

Panel (A): By overall social responsibility		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.363** (0.177)	−0.437*** (0.132)
Observations	13550	13260
Number of firms	35	34
$R^2$	0.416	0.463
Panel (B): By firms' reputation within the general community		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.377** (0.183)	−0.422*** (0.124)
Observations	13550	13260
Number of firms	39	37
$R^2$	0.413	0.464
Panel (C): By total assets		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.515*** (0.150)	−0.420*** (0.175)
Observations	14720	14657
Number of firms	38	38
$R^2$	0.375	0.483
Panel (D): By Herfindahl-Hirschman Index of institutional ownership		
	(1)	(2)
	Below median	Above median
Average abnormal return	−0.578*** (0.196)	−0.354** (0.181)
Observations	10920	10820
Number of firms	28	28
$R^2$	0.481	0.333

Note: Each cell represents the coefficient of the average abnormal return in model (1). The event window is [0, 1]. “Below median” and “Above median” are the samples of firms with below-median and above-median values of the corresponding firm characteristic. Standard errors are given by the maximum of robust standard errors, standard errors clustered by trading days, and standard errors clustered by firms. \*: significance at 10% level; \*\*: significance at 5% level; \*\*\*: significance at 1% level.

**Table 10: Summary Statistics for the Use of Subsidiaries in the Updated List**

Panel (A): The use of subsidiaries according to the 2013 list							
Variable	Mean	S.D.	Min.	1st Quartile	Median	3rd Quartile	Max.
Number of subsidiaries	321.094	395.808	14.000	97.500	235.500	426.000	2697.000
— in tax havens	77.781	108.825	0.000	19.500	46.000	94.000	618.000
— in non-tax havens	243.313	294.259	9.000	67.500	198.500	323.000	2079.000
% of subsidiaries in tax havens	0.239	0.108	0.000	0.180	0.216	0.272	0.580
— excluding Delaware	0.172	0.107	0.000	0.105	0.156	0.208	0.580
— “Dot” havens only	0.186	0.101	0.000	0.137	0.167	0.206	0.568
— “Secret” havens only	0.066	0.065	0.000	0.033	0.054	0.077	0.474

Panel (B): Changes (Figures in the 2013 list minus the corresponding figures in the 2011 list)							
Variable	Mean	S.D.	Min.	1st Quartile	Median	3rd Quartile	Max.
Number of subsidiaries	-5.766	72.917	-311.000	-18.000	0.000	12.500	249.000
— in tax havens	0.422	15.324	-80.000	-2.000	1.000	5.000	45.000
— in non-tax havens	-6.188	61.287	-284.000	-14.500	-0.500	10.500	204.000
% of subsidiaries in tax havens	-0.000	0.034	-0.201	-0.009	0.002	0.015	0.090
— excluding Delaware	-0.001	0.029	-0.165	-0.013	0.000	0.012	0.067
— “Dot” havens only	-0.001	0.029	-0.176	-0.008	0.003	0.010	0.072
— “Secret” havens only	-0.002	0.014	-0.050	-0.005	0.000	0.005	0.028

Note: The sample includes 64 non-financial firms which appear in 2011 and 2013 lists of tax haven use published by ActionAid.

**Table 11: Correlations between Changes in the Use of Subsidiaries, CAR, Firm Characteristics, and Changes in Negative News Coverage**

	(1)	(2)	(3)	(4)
	$\Delta$ No. of subsidiaries	$\Delta$ No. of subsidiaries in tax havens	$\Delta$ No. of subsidiaries in non-tax havens	$\Delta$ % of subsidiaries in tax havens
CAR[0, 1]	-0.066 (0.601)	0.019 (0.882)	-0.083 (0.513)	0.258 (0.040)
Social responsibility	-0.080 (0.549)	-0.069 (0.603)	-0.077 (0.561)	0.000 (0.998)
Profitability	0.023 (0.855)	0.050 (0.696)	0.015 (0.905)	0.142 (0.265)
$\Delta$ Negative news coverage (1 quarter)	-0.347 (0.005)	-0.429 (0.000)	-0.306 (0.014)	0.038 (0.768)
$\Delta$ Negative news coverage (2 quarters)	-0.246 (0.050)	-0.255 (0.042)	-0.229 (0.069)	-0.051 (0.688)

Note:  $p$ -values of the correlation coefficients are in parentheses.

**Table 12: Market Reactions to ActionAid (2013)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Average abnormal return	-0.038 (0.109)	-0.036 (0.110)	-0.034 (0.111)	-0.037 (0.109)	-0.038 (0.109)	-0.029 (0.109)	-0.038 (0.109)	-0.039 (0.110)	-0.040 (0.113)
Δ No. of subsidiaries		0.000 (0.001)							
Δ No. of subsidiaries in non-tax havens			0.001 (0.001)						
Δ No. of subsidiaries in tax havens				-0.001 (0.003)					
Δ No. of subsidiaries in “Dot” tax havens					-0.003 (0.003)				
Δ No. of subsidiaries in “Secret” tax havens						-0.020 (0.021)			
Δ % of subsidiaries in tax havens							-1.147 (2.494)		
Δ % of subsidiaries in “Dot” tax havens								0.938 (2.792)	
Δ % of subsidiaries in “Secret” tax havens									-1.163 (6.912)
Observations	23482	23482	23482	23482	23482	23482	23482	23482	23482
Number of firms	64	64	64	64	64	64	64	64	64
R <sup>2</sup>	0.281	0.281	0.281	0.281	0.281	0.281	0.281	0.281	0.281

Note: The event window is [0, 1] in which day 0 is May 23, 2013. Standard errors are given by the maximum of robust standard errors, standard errors clustered by trading days, and standard errors clustered by firms. \*: significance at 10% level; \*\*: significance at 5% level; \*\*\*: significance at 1% level.

**Table 13: Changes in the Use of Subsidiaries for Firms with Largest and Smallest CARs**

	(1)	(2) (3) (4) No. of subsidiaries			(5)	(6) (7) (8) % of subsidiaries in tax havens		
	CAR[0,1] (%)	All	in tax havens	in non-tax havens	All	Excluding Delaware	“Dot” havens only	“Secret” havens only
Top 1	1.306	-35	2	-37	0.016	-0.001	0.019	-0.002
Top 2	1.189	-23	3	-26	0.012	-0.001	0.016	-0.002
Top 3	1.182	11	7	4	0.002	0.000	0.002	0.000
Top 4	1.097	104	8	96	-0.032	-0.029	-0.004	-0.019
Top 5	1.020	9	5	4	0.017	0.017	0.018	-0.002
Bottom 1	-3.596	6	3	3	-0.006	-0.006	-0.005	-0.024
Bottom 2	-2.573	0	0	0	0.000	0.000	0.000	0.000
Bottom 3	-1.920	-152	-59	-93	-0.030	-0.029	-0.033	0.005
Bottom 4	-1.637	249	45	204	-0.201	-0.165	-0.176	-0.042
Bottom 5	-1.526	22	2	20	-0.050	-0.035	-0.048	-0.015

Note: Among the non-financial firms which appear in both the 2011 and 2013 lists of tax haven use published by ActionAid, Top 1 to 5 firms have the largest CARs over [0, 1] and bottom 1 to 5 firms have the smallest CARs over [0, 1] in 2011.

**Table 14: Differences in CARs and Social Responsibility Scores Among Firms Substituting From “Dot” or “Secret” Havens to Other Tax Havens and Those Substituting From Other Tax Havens to “Dot” or “Secret” Havens**

	(1) Mean of Group 1	(2) Mean of Group 2	(3) Difference
CAR[0, 1]	-0.813	-0.239	-0.574**
Social responsibility	84.107	87.878	-3.771

Note: Group 1 contains firms decreasing the shares of subsidiaries in “Dot” or “Secret” havens and increasing the shares of subsidiaries in other tax havens; Group 2 contains firms increasing the shares of subsidiaries in “Dot” or “Secret” havens and decreasing the shares of subsidiaries in other tax havens. \*: significance at 10% level; \*\*: significance at 5% level; \*\*\*: significance at 1% level.

## Appendix

### A. The Model: A Sequential-move Game with 2 Stages

**In stage 1**, a firm decides the amounts of investment in non-tax havens and tax havens ( $K$  and  $K'$ , respectively). There is a common shadow cost represented by  $\lambda$  (which, without loss of generality, can be set to 1); different unit costs are given by  $c$  and  $c'$ , respectively. Let  $\tau(K')$  be the firm's effective tax rate as a function of  $K'$ . Since tax havens can help firms lower their taxes, assume  $\partial\tau(K')/\partial K' < 0$ .

The firm's revenue consists of two parts: [1]  $Q(K, K')$  is taxed, where  $Q_1 > 0$ ,  $Q_{11} < 0$ ,  $Q_2 > 0$ , and  $Q_{22} < 0$ . Assume  $Q_{12} \geq 0$ , i.e., the investment in non-tax havens will not lower the marginal product of the investment in tax havens, vice versa. [2] The non-taxed part given by  $Q'(K') \geq 0$ .<sup>46</sup> This part corresponds to those businesses the firm takes in tax havens for which they are not taxed in non-tax havens. Whether these investments make the firm more profitable, however, depends on the extent of managerial diversion, denoted by  $d$ . The firm's profit is given by:

$$\pi = [1 - \tau(K')]Q(K, K') + Q'(K') - (cK + c'K') - d. \quad (\text{A.1})$$

**In stage 2**, the firm's manager can divert resources (denoted  $d$ ) from both non-tax havens and tax havens, subject to some costs, to maximize her utility:

$$U = d - \frac{\gamma d^2}{2(\alpha K + K')}, \quad (\text{A.2})$$

Stronger corporate governance corresponds to a higher  $\gamma$ . Under stronger corporate governance, it becomes harder for the manager to divert firm resources for personal benefits. Diverting resources is easier when firm has more investments. Assume  $\alpha \neq 1$ , i.e., diverting resources from non-tax havens and tax havens entails different costs.

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<sup>46</sup>This set up allows the possibility that tax havens enlarge the business opportunity set. This is the case when  $\partial[Q(K, K') + Q'(K')]/\partial K' > 0$ .

*Subgame-perfect equilibrium*

In stage 2, given  $K$  and  $K^t$ , the manager chooses  $d$  to maximize utility. The first order condition gives:

$$d^* = \frac{\alpha K + K^t}{\gamma}. \quad (\text{A.3})$$

Substituting it into (A.1), the profit function of the firm becomes:

$$\pi = [1 - \tau(K^t)]Q(K, K^t) + Q^t(K^t) - (cK + c^t K^t) - \frac{\alpha K + K^t}{\gamma}. \quad (\text{A.4})$$

In stage 1, the firm chooses  $K$  and  $K^t$  to maximize (A.4). The first order conditions are:

$$K : [1 - \tau(K^t)] \frac{\partial Q(K, K^t)}{\partial K} = c + \frac{\alpha}{\gamma}, \quad (\text{A.5})$$

$$K^t : [1 - \tau(K^t)] \frac{\partial Q(K, K^t)}{\partial K^t} - \frac{\partial \tau(K^t)}{\partial K^t} Q(K, K^t) + \frac{\partial Q^t(K^t)}{\partial K^t} = c^t + \frac{1}{\gamma}. \quad (\text{A.6})$$

The subgame-perfect equilibrium is that the firm's optimal invest  $K^*$  in non-tax havens and  $(K^t)^*$  tax havens as defined by (A.5) and (A.6), and the manager diverts  $d^* = (\alpha K^* + (K^t)^*)/\gamma$ . A few results follow.

**Result 1:** Firm value decreases with the cost of using tax havens:  $\partial \pi^* / \partial c^t < 0$ .<sup>47</sup>

**Result 2:** Investment in tax havens decreases with its cost:  $\partial (K^t)^* / \partial c^t < 0$ .

This result comes from differentiating the two first order conditions in (A.5) and (A.6) with respect to  $c^t$  and applying the Cramer's Rule to get:

$$\frac{\partial (K^t)^*}{\partial c^t} = \frac{\pi_{11}}{\pi_{11}\pi_{22} - \pi_{12}^2}, \quad (\text{A.7})$$

where  $\pi_{11}$  is the second derivative of  $\pi$  with respect to  $K$  and so on. By standard assumptions of maximization,  $\pi_{11} < 0$  and  $\pi_{11}\pi_{22} - \pi_{12}^2 > 0$ . Therefore,  $\partial (K^t)^* / \partial c^t < 0$ ; the firm's demand curve for tax havens is downward-sloping.

<sup>47</sup>This result follows directly from the Envelope Theorem.

**Result 3:** *Investment in tax havens increases with the strength of corporate governance:  $\partial(K^t)^*/\partial\gamma > 0$ .*

This result comes from differentiating the two first order conditions in (A.5) and (A.6) with respect to  $\gamma$  and applying the Cramer's Rule:

$$\frac{\partial(K^t)^*}{\partial\gamma} = \frac{-\pi_{11}/\gamma^2 + \alpha\pi_{12}/\gamma^2}{\pi_{11}\pi_{22} - \pi_{12}^2}. \quad (\text{A.8})$$

Since  $\pi_{11} < 0$ ,  $\pi_{12} = (1 - \tau)\partial^2 Q/(\partial K \partial K^t) - (\partial\tau/\partial K^t)(\partial Q/\partial K) > 0$ , and the denominator is positive, the above term is positive.

**Result 4:** *Under an increase in the cost of using tax havens, a firm with stronger corporate governance*

*(a) has a larger drop in its absolute value :  $\partial^2 \pi^*/(\partial c^t \partial \gamma) < 0$ ; and*

*(b) has a larger drop in its relative value (i.e.,  $\partial^2 \log \pi^*/(\partial c^t \partial \gamma) < 0$ ) if:*

$$\frac{1}{(K^t)^*} \frac{\partial(K^t)^*}{\partial\gamma} > \frac{1}{\pi^*} \frac{\partial\pi^*}{\partial\gamma}.$$

To see **Result 4(a)**, we note that:

$$\frac{\partial^2 \pi^*}{\partial c^t \partial \gamma} = \frac{\partial}{\partial\gamma} \left( \frac{\partial\pi^*}{\partial c^t} \right) = \frac{\partial}{\partial\gamma} (-(K^t)^*) = -\frac{\partial(K^t)^*}{\partial\gamma} < 0, \quad (\text{A.9})$$

since  $\partial(K^t)^*/\partial\gamma > 0$  by Result 3.

To see **Result 4(b)**, a change in the firm value in *percentage* is expressed as  $\partial \log \pi^*/\partial c^t$  and  $\partial^2 \log \pi^*/(\partial c^t \partial \gamma)$ , where

$$\frac{\partial^2 \log \pi^*}{\partial c^t \partial \gamma} = \frac{\partial}{\partial\gamma} \left( \frac{1}{\pi^*} \frac{\partial\pi^*}{\partial c^t} \right) = -\frac{1}{(\pi^*)^2} \frac{\partial\pi^*}{\partial\gamma} \frac{\partial\pi^*}{\partial c^t} + \frac{1}{\pi^*} \frac{\partial^2 \pi^*}{\partial c^t \partial \gamma}. \quad (\text{A.10})$$

Using the previous results, we have:

$$\frac{\partial^2 \log \pi^*}{\partial c^t \partial \gamma} = \frac{1}{(\pi^*)^2} \frac{\partial\pi^*}{\partial\gamma} (K^t)^* - \frac{1}{\pi^*} \frac{\partial(K^t)^*}{\partial\gamma} = -\frac{(K^t)^*}{\pi^*} \left[ \frac{1}{(K^t)^*} \frac{\partial(K^t)^*}{\partial\gamma} - \frac{1}{\pi^*} \frac{\partial\pi^*}{\partial\gamma} \right]. \quad (\text{A.11})$$

Therefore, we can see that  $\partial^2 \log \pi^* / (\partial c^t \partial \gamma) < 0$  if and only if:

$$\frac{1}{(K^t)^*} \frac{\partial (K^t)^*}{\partial \gamma} > \frac{1}{\pi^*} \frac{\partial \pi^*}{\partial \gamma}. \quad (\text{A.12})$$

The left hand side of this inequality is the percentage change of tax haven use with respect to a unit change in corporate governance standard whereas the right hand side is the percentage change of firm value with respect to a unit change in corporate governance standard. This inequality essentially concerns the sensitivity of tax haven investment to corporate governance relative to that of total firm value to corporate governance. If the former is sufficiently large, then the above inequality holds so that the model predicts that the report triggers a more pronounced drop in the fraction of total firm value for better-governed firms.



## B. Variable Definition

Table A shows the definitions of the key variables used in the empirical analysis.

**Table A: Variable definition**

Variable	Definition	Source
Corporate governance	<p>The measure is based on 41 firm-level governance attributes covering four broad subcategories:</p> <ol style="list-style-type: none"> <li>1. Board (24 attributes): They capture the aspects of the board of directors such as board independence, composition of committees, size, transparency, and how the board conducts its work.</li> <li>2. Audit (three attributes): They include questions on the independence of the audit committee and the role of auditors.</li> <li>3. Anti-takeover provisions (six attributes): They are drawn from the firm's charter and by-laws and refer to dual-class structure, role of shareholders, poison pills, and blank check preferred.</li> <li>4. Compensation and ownership (eight attributes): They deal with executive and director compensation on issues related to options, stock ownership and loans, and how compensation is set and monitored.</li> </ol>	Gov41 index from Aggarwal et al. (2011)
Corporate social responsibility	It measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and health of its license to operate, which are key factors in determining its ability to generate long term shareholder value	Score on the Social Responsibility pillar from Asset4
Log (Total assets)	Total assets in natural logarithm.	Compustat Global
Multinationality	Number of non-tax haven countries where a firm's subsidiaries are located, in natural logarithm.	ActionAid (2011)
Leverage	Total liabilities divided by total assets.	Compustat Global
Intangible assets	Intangible assets divided by total assets.	Compustat Global
Inventory	Inventory divided by total assets.	Compustat Global
R&D	R&D expenses divided by total assets	Compustat Global
Capital expenditure	Capital expenditure divided by total assets.	Compustat Global
Profitability	Operating income before depreciation divided by total assets	Compustat Global
Asset tangibility	Total property, plant, and equipment divided by total assets	Compustat Global

## Highlights

- On October 11, 2011, a non-governmental organization published a report condemning the FTSE 100 firms for holding an unusually large number of subsidiaries in tax havens.
- The report raised the firms' costs of holding tax haven subsidiaries.
- FTSE100 nonfinancial firms experienced an average abnormal price drop of 0.9% (or about £9 billion in market capitalization).
- Better-governed firms and firms with larger shares of subsidiaries in tax havens experienced larger drops.
- We find some evidence that government scrutiny, reputation, and investor sentiment were plausible channels of the negative impact.